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FURTHER EVIDENCE OF THE INABILITY OF *BR. ABORTUS* STRAIN 45 (20) TO INFECT NON-PREGNANT CATTLE

A. D. McEWEN,

VETERINARY DEPARTMENT, SOUTH-EASTERN AGRICULTURAL COLLEGE, WYE, KENT

It has been shown that when *Br. abortus* strain 45 (20) was inoculated into heifers, both before and after pregnancy, the animals were not infected by the strain, and they did not develop serum agglutinins; nevertheless, a very considerable resistance to infection with a virulent strain was produced (McEwen, 1940). It was therefore suggested that strain 45 (20) should be used as a vaccine for the protection of non-infected cattle in infected herds and that under some circumstances it might be desirable to vaccinate animals in abortion-free herds in order to give them a protection that might prevent the spread of the disease were infection introduced into the herd.

The present notes are concerned with further experiments on the inoculation of strain 45 (20) into a limited number of cattle and with examinations made on these cattle for evidence of infection.

Previous experiments have shown that the subcutaneous inoculation of strain 45 (20) into pregnant cattle may cause infection and abortion (McEwen, 1940). It has also been found that the inoculation of cattle before service with vaccine prepared from the non-virulent strain 45, does not protect the animals against infection caused by the inoculation of strain 45 (20) after service (McEwen, 1940). Any immunity stimulated by the inoculation of strain 45 is therefore of a low grade.

EXPERIMENTS IN COWS

Four cows that were in lactation, and had been vaccinated with strain 45 fourteen months previously, were purchased. These cattle became available because they had failed to pass a tuberculin test. Three of them had not been served since calving; the fourth was pregnant.

Cow 1.—This animal had calved on February 9th, 1939. On April 18th serum agglutinins were present in a titre of 1 : 160. This titre is in conformity with that shown by non-infected cattle that have been vaccinated on more than one occasion with strain 45. Quarter samples of cream were collected on six occasions from April 25th to May 3rd and cultivated for *Br. abortus*, but this organism was not isolated.

On May 10th the cow was inoculated subcutaneously with 4 c.c. of a suspension of strain 45 (20) equivalent in opacity to No. 12 tube on the Brown's scale. Blood samples were collected on May 24th June 12th and 23rd and July 4th, but at no time were serum agglutinins found in higher titre than before the inoculation of strain 45 (20). Quarter samples of gravity cream were cultivated for *Br. abortus* on 20 occasions between May 17th and July 15th, but in no instance was *Br. abortus* isolated.

The cow was slaughtered on July 17th and portions of organs were removed with sterile precautions. Materials from the following organs were cultivated for *Br. abortus*: spleen, liver, kidney, mammary gland, uterus, prescapular lymphatic glands, precrural lymphatic glands, popliteal lymphatic glands, femoral lymphatic glands, iliac lymphatic glands, mesenteric lymphatic glands, portal lymphatic glands, bronchial and posterior mediastinal lymphatic glands and mammary lymphatic glands. In no instance was *Br. abortus* cultivated from any of these organs.

Material from the following organs was inoculated in each case into two guinea-pigs: liver, spleen, kidney, mammary gland, uterus, throat lymphatic glands, scapular and popliteal lymphatic glands, precrural lymphatic glands, portal lymphatic glands, iliac lymphatic glands, mammary lymphatic glands. The guinea-pigs were killed after a suitable interval and examined for *Br. abortus* infection, but none was found infected with this organism.

Cow 2.—This cow had calved on September 18th, 1938, and had been served on November 23rd of that year. Prior to the inoculation of strain 45 (20) serum agglutinins were present at a titre of 1 : 160. The animal was inoculated subcutaneously on May 10th, 1939, with a quantity of culture of strain 45 (20) similar to that given to cow 1. Prior to and following inoculation *Br. abortus* could not be cultivated from the gravity cream, which was repeatedly examined. The titre of the serum agglutinins did not rise after the inoculation of strain 45 (20). The animal was killed on July 24th, 1939, and her organs were examined for *Br. abortus* in the same way as the organs from cow 1 had been examined. The pregnant uterus was found to be infected with *Br. abortus* and this organism was also recovered from prescapular and femoral lymphatic glands. The udder and the mammary lymphatic glands were not found infected. The strain of *Br. abortus* recovered from the cow was

rough, showing that the infection had originated from the inoculation of strain 45 (20).

Cow 3.—This cow had calved on July 3rd, 1939, and had not been served. Before the inoculation of strain 45 (20) serum agglutinins were present at a titre of 1 : 160, and repeated cultural examinations of the gravity cream had failed to demonstrate *Br. abortus*.

On May 10th, 1939, the cow was inoculated intravenously with 4 c.c. of a suspension of strain 45 (20) similar to that given to animals 1 and 2. Quarter cream samples were cultivated for *Br. abortus* on May 17th, 18th and 19th but the organism was not recovered from any of them.

On the morning of May 21st the cow was observed to be suffering from haemoglobinuria and showed the typical symptoms of an acute piroplasmosis. Blood smears made on the same day revealed large numbers of red blood corpuscles invaded by piroplasms. The animal died on the evening of May 23rd. A *post-mortem* examination was not carried out until 18 hours after death and no bacteriological examination was made.

Cow 4.—This animal calved on December 31st, 1938, and had not been served. On May 10th, 1939, she received an intravenous inoculation of 4 c.c. of a suspension of strain 45 (20). Prior to the intravenous inoculation, serum agglutinins showed a titre of 1 : 20 ; at no time after the inoculation did the titre increase. Quarter samples of gravity cream were collected before and after inoculation on the same dates as were the samples of cream from cows 1 and 2. These were cultivated for *Br. abortus* but this organism was not isolated. The cow was slaughtered on July 7th and her organs were examined for *Br. abortus* in a similar manner to that described for cow 1 ; *Br. abortus* was not isolated either by direct cultural means or by guinea-pig inoculations.

EXPERIMENTS IN HEIFERS

Two heifers that were non-reactors to the agglutination test and had been isolated from all infected cattle since birth were inoculated intravenously on June 14th, 1939, with 4 c.c. of a suspension of strain 45 (20). The animals were bled on June 23rd, July 4th, 19th and 26th, and August 5th, 12th, 19th and 26th, 1939, and their sera tested for agglutinins for *Br. abortus*. On no occasion was a positive reaction obtained in dilutions of serum of 1 : 10 or higher. At a later date heifer No. 5 was served and she gave birth to a full term, healthy calf on July 27th, 1940. Colostrum and material from the foetal membranes were inoculated into guinea-pigs and also cultivated for *Br. abortus*, but this organism was not found. The colostrum showed no agglutinins nor were serum agglutinins demonstrated after calving, although repeated examinations were made.

Heifer No. 6, although not served, was kept in experiment until one year after she had been inoculated, but at no time were agglutinins found in her serum.

Heifers in an Abortion-free and Tuberculosis-free Herd of Hereford Cattle

The heifers in this herd were vaccinated with strain 45 (20). From May, 1939, until the herd was sold 17 months later, all the heifers were vaccinated before service.

Heifers 1 *and* 2.—These animals were each inoculated subcutaneously on three occasions with 4 c.c. of a suspension of strain 45 (20) equivalent in opacity to tube 12 of the Brown's scale ; the inoculations were made in May, July and September, 1939. Before and after the first and second inoculations no agglutinins were found in the heifers' sera. Both heifers gave birth to full-time healthy calves in October, 1940. No serum agglutinins were present after calving. The colostrum and foetal membranes were examined for *Br. abortus* by direct cultural means and by guinea-pig inoculation. Eight guinea-pigs were used for each heifer ; four were inoculated with colostrum and four with material from the foetal membranes. *Br. abortus* was not recovered from either of the heifers.

Unfortunately this herd was sold and dispersed in October, 1940, before any of the other 37 vaccinated heifers had calved and the opportunity to examine their foetal membranes and colostrum for *Br. abortus* was lost. The available information regarding these heifers is as follows :—

Two heifers were vaccinated three times—in May, July and September, 1939. Their sera showed no agglutinins for *Br. abortus* in June and September, 1939, and in March, September and October, 1940.

Twelve heifers were vaccinated three times—in October and December, 1939, and March, 1940. Their sera were tested for agglutinins in December, 1939, March, May, September and October, 1940, but no agglutinins were found.

Nine heifers were vaccinated three times in December, 1939, March and May, 1940. No serum agglutinins were found at tests made in March, May, September and October, 1940.

Six heifers were vaccinated in April, May and August, 1940. Their sera were tested for agglutinins in August, September and October, 1940, but with negative results.

Six heifers were vaccinated once only in August, 1940, and they were tested in September and October, 1940, when their sera showed no agglutinins for *Br. abortus*.

DISCUSSION

Further evidence is presented to show that the inoculation of strain 45 (20) into non-pregnant cows and heifers does not stimulate the appearance of agglutinins for smooth strains of *Br. abortus*, and does not infect the animals.

The four cows that were inoculated with strain 45 (20) had formerly been vaccinated with the non-virulent strain 45, but it has been shown (McEwen, 1940) that any immunity animals may develop after vaccination with that strain is insufficient to protect them against inoculations of relatively large doses of strain 45 (20) during pregnancy. This was again demonstrated in the present experiments by the infection of the only pregnant cow with strain 45 (20). Because vaccination with strain 45 affords only a very slight protection against heavy inoculations of strain 45 (20) the evidence obtained from two cows that were slaughtered and examined bacteriologically after inoculation with the strain may be accepted as showing that non-pregnant cows are very resistant to infection with large doses of this strain whether inoculated

subcutaneously or intravenously. Intravenous inoculation is a most drastic method of exposure to infection; thus it has been shown that the subcutaneous inoculation of the non-virulent strain 45 into pregnant cattle did not infect the animals but when the same strain was inoculated intravenously the pregnant uterus was infected (McEwen, 1937).

Although the intravenous inoculation of strain 45 (20) did not infect non-pregnant cattle, the reaction it caused in one cow lit up a latent piroplasmosis that killed the animal. The author is not aware of any report of a similar sequel to the subcutaneous inoculation of *Br. abortus* vaccine; if it did occur it could hardly have escaped comment in districts where piroplasmosis was enzoötic and where living *Brucella* vaccine has been freely used.

The cow that died from piroplasmosis had been brought from Scotland to Kent eight years previously. *Ixodes ricinus*, the vector of bovine piroplasmosis in Great Britain, is an unknown parasite in Kent where the only species of tick recognised is *Haemophysalis punctata*. Furthermore, since arriving in Kent the cow had never been on a farm where ticks were known. There is little doubt that the animal acquired the piroplasmosis infection in Scotland at least eight years before her death. The intravenous inoculation of cultures of *Br. abortus* is therefore not to be considered where the least possibility of a latent piroplasmosis infection exists.

The inoculation of the heifers in an abortion-free herd appeared to offer an invaluable opportunity to demonstrate the inability of strain 45 (20) to infect pregnant cattle of breeding age, and the inability of the strain to stimulate the production of agglutinins in these animals. Although the experiment terminated prematurely, it provided substantial evidence in support of the claims made for strain 45 (20).

Summary

Four cows that had been vaccinated with strain 45 fourteen months previously were inoculated with strain 45 (20). It had been shown that any immunity strain 45 may stimulate is insufficient to protect animals against the inoculations of strain 45 (20) to which the animals were subjected.

Two of the cows, one a non-pregnant and the other a pregnant animal, were inoculated subcutaneously with strain 45 (20). Both animals were killed a few weeks later and representative tissue examined bacteriologically for *Br. abortus*. No organisms were found in the non-pregnant animal. *Br. abortus* was isolated from the uterus of the pregnant cow and also from two of the lymph glands.

The two remaining cows were non-pregnant and these were inoculated intravenously with strain 45 (20). A few days after this inoculation one animal died from piroplasmosis. The other cow was slaughtered a few weeks after inoculation and her tissues were examined for *Br. abortus*, but she was not found to be infected with this organism.

The evidence from these experiments indicates that non-pregnant cows are not infected either by the subcutaneous or by the more drastic intravenous inoculation of relatively large doses of strain 45 (20). The intravenous inoculation of *Br. abortus* may light up a latent piroplasmosis and in this respect it is dangerous.

Two non-pregnant heifers of breeding age were inoculated intravenously with strain 45 (20). Neither of the animals became a positive reactor to the agglutination test. One of the heifers was served and calved normally and on calving she was found to be free from infection.

The non-pregnant heifers of breeding age in an abortion-free herd were vaccinated with strain 45 (20). Unfortunately the herd was dispersed 17 months after the first animals had been vaccinated, but during that period 33 heifers each received three inoculations of culture at approximately two-month intervals, and six other animals were inoculated once. Only two of the heifers had calved before the herd was dispersed and both of them were found to be free from infection at the time of calving. None of the animals ever showed any reaction to the agglutination tests made at intervals during the time they were being vaccinated or after the course of vaccination inoculations had been completed.

The evidence from all these animals, cows and heifers, supports the claim that the inoculation of strain 45 (20) into non-pregnant cattle causes neither infection nor the production of agglutinins.

References

McEwen, A. D. (1937), *Vet. Rec.* **49.** 1538.
———. (1940), *Ibid.* **52.** 97. *Ibid.* **52.** 815.

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A Simple and Effective Vaginoscope

N. S. BARRON, B.Sc., Ph.D., M.R.C.V.S.
Veterinary Department, University of Reading

The diagnosis of pregnancy, involving as it does the examination of the genitalia of the cow, has, within a brief space of time, attracted considerable attention and the eyes of the profession have been focused on an aspect of veterinary surgery that has for too long been overlooked.

Though not essential to the diagnosis of pregnancy as such, an examination of the vaginal passage and cervix is valuable in order that a complete picture of the existing state of affairs may be procured. Vaginitis or cervicitis may be present, but in the absence of any discharge they are not easy to detect other than by visual examination. The illustration here is of a cheap and simple vaginoscope which makes such an observation extremely easy and avoids the disadvantages associated with the use of a speculum and an illuminant attached to the forehead. To suit both heifers and cows at least two sizes of specula are needed—and these are expensive instruments—and a forehead light, not being at exactly eye level, is apt to cast shadows on the parts in the field of view.

The vaginoscope, as illustrated, is a light metal tube, the anterior end being from 1½ to 2 inches in diameter and the posterior end 2 to 2½ inches (the smaller size for heifers). The edges are rounded off to facilitate insertion. Into the outer tube is fitted a copper tube protecting a flex which leads to a small four-volt bulb fitted into a holder and itself protected by a circular metal shield (this portion is detachable to allow for cleaning and disinfection). When inserted into the outer tube the shield comes to rest in such a position that the bulb lies against the former within a few inches of its anterior end. The two ends of the flex can be attached to a hand torch or clipped on to the metal strips of a battery.

Apart from the unobstructed view and the direct illumination which this instrument gives, if it is lightly soaped or wet it can be inserted *per vaginam* with a minimum of irritation. By appropriate manipulation the entire cavity can be examined minutely, the presence or absence of the cervical plug of mucus or of any abnormal secretion observed and samples of the latter collected by tilting the tube suitably. Artificial insemination into the entrance to the cervical canal can also be carried out accurately by direct observation.

[Messrs. J. T. Spencer & Sons, Ltd., 27, London Road, Reading, already have this instrument in production.]

Weekly Wisdom

Whenever we meet with any defect in the means we are contriving for accomplishing a given object, that defect should be noted and reserved for future consideration, and inquiry should be made—whether that which is a defect as regards the object in view may not become a source of advantage in some totally different subject.—Charles Babbage : " Passages from the Life of a Philosopher," 1864, p. 452.

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If the hopes of the Rural Communities Council are realised mechanisation of farming methods will lead to a revival in the industry of the village blacksmith, and he will become more and more an " agricultural engineer."

THE VETERINARY RECORD

June 21st, 1941.

AGRICULTURAL RESEARCH AND THE FARMER

DURING a recent debate on food production, the Minister of Agriculture, Mr. R. S. Hudson, announced that the Agricultural Research Council would be granted an increased sum for use at its unfettered discretion to promote basic or fundamental research. This announcement, had it been made by itself, would have given rise to considerable anxiety among farmers and veterinarians, many of whom consider the work of the Council already to be far removed from actual agricultural practice.

The fears of this school of thought would indeed have been materially increased by the recent, apparently inappropriate, appointment of a medical bacteriologist as Secretary to the Council, had it not been known that the individual selected had certain personal qualities of drive and breadth of vision which foster the hope that a progressive, vigorous policy in agricultural research will be pursued. Despite the criticisms of this appointment voiced in our correspondence columns—criticisms with which we are in fundamental agreement—we are reassured by the knowledge that Professor Topley has the interests and advancement of the veterinary profession and veterinary research very much at heart. In fact we confidently look forward to an increased professional representation on the Council and its committees during his tenure of office.

The doubts immediately aroused in some minds by the Minister's announcement of the increased grants to the Agricultural Research Council were, however, promptly removed by the context of the remainder of his speech. Mr. Hudson went on: " At the same time we are impressed with the need of taking more active steps to see that the results of research are made known to the ordinary farmer and given greater opportunities of establishing themselves in everyday practice. To this end I propose to appoint a body for England and Wales which will be responsible to me directly and which I hope will command as much respect in the agricultural world as the Agricultural Research Council does in the scientific world. The functions of this body will be twofold. On the one hand, it will be concerned to devise methods for seeing that all promising results of research are applied as rapidly as possible to the problems of agriculture and are incorporated in the practice of the everyday farmer. On the other hand, it will keep me informed—so that I can advise the Agricultural Research Council—on any problems of agricultural practice which it considers should be the subject of scientific investigation."

On behalf of the profession we warmly welcome the creation of this new Agricultural Improvement

Council, the primary objects of which are so much in line with the aims of the Association's agricultural policy. The success of this body is assured, not only because it meets a long felt need, but also because of the excellence and balance of its personnel. Upon this occasion we take special pleasure in congratulating the Minister upon this further example of the Ministry's adherence to the newly instituted policy of including veterinary representation upon official bodies concerned with livestock. There is no doubt that the veterinary knowledge and experience available to the committee through the presence of Professor Dalling and Mr. E. C. Lloyd will facilitate the application of the benefits which the profession has to offer to agriculture.

REVIEW

["**HOW TO DRAW HORSES**," by John Skeping. Published by The Studio, London. Price 2s. 6d.]

This little book is one which, by virtue of the illustrations alone, will have a strong appeal to veterinarians. The text does not go into detail in describing how to draw a horse, but rather instructs the reader how to deduce from the illustrations how best this may be accomplished. For this purpose, the author begins with a chapter devoted to children's drawings. This is followed by short sections devoted to diagrams of action, the use of materials, drawing from life, with a final section on invention and experiment.

Perhaps the theme of the book is best brought home by the following quotation: "Much can be discovered by accident, but if this is to be turned to good account, you must analyse thoroughly each completed drawing, finding the cause of the effects you have obtained," together with the concluding phrase in the book which is, "I think you will agree with me that the result of this experiment was satisfactory, and proved, beyond doubt, that drawing for fun is the surest way of obtaining successful results." The author emphasises the fact that a drawing with an artistic appeal is not necessarily based upon accurate anatomical structure; in fact, he stresses the point that a too rigid following of the latter often leads to a failure to achieve the former.

This little book is well worth the modest price asked, and should prove a delight to those veterinarians who decide to purchase it. Especially will it appeal to those who spend time at committees "doodling."

H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at Hotel Lindum, St. Anne's, Lytham St. Anne's, Lancs.

	Price net s. d.	*Post free* s. d.
Statutory Rules and Orders, 1941:		
E.P. 795. Livestock (Control) Order, June 4th	0 1	0 2
Medical Research Council:		
War Medicine, Bulletin of. No. 5. May, 1941. (45-10-5)	2 6	2 9

CLINICAL COMMUNICATION

"A Mixed Bag"

P. J. HOWARD, M.R.C.V.S.
Ennis, Co. Clare

I submit these notes on the following cases, because they are somewhat extraordinary and may, I hope, provide some little diversion in these strenuous times.

Case I.—The subject of my first case was a three-year-old colt, concerning which, in April, 1940, the owner came to seek advice. He said the colt used to get a cramp in a foreleg, that it would occur at any time, and especially when the horse started to feed. He brought the animal with him, and said he was anxious to know what to do. The colt, a very fine horse, was in splendid condition and one could not see anything wrong. He had come about 14 miles and the man said he had got no cramp on the road, but he would probably have it immediately when put in a stable.

We put him in a loose box, and almost at once he shot out the off foreleg and the whole body became rigid. He also started wind sucking: the owner said he had always done that, and did not think it was anything wrong. I explained the significance of the habit, and that the apparent cramp was part of his antics connected with the act of wind sucking.

We had the colt outside and managed to get the accompanying snapshot, which shows the position exactly.

The colt evidently began wind sucking as a foal and possibly used to rest his chin on the leg, then getting into the way of thrusting out the leg to meet his chin. I advised the man to train and use the colt. He was sold in May at a good price, so I lost touch with him.

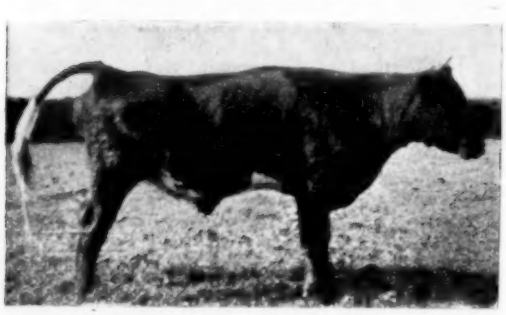
I have never seen a similar case, and would be interested to hear of any one who has.

Case II.—Last September I was asked to see a bullock that had "a swelling under the tail." I found a two-year-old bullock in nice condition with, apparently, a swelling about the size of a marrow below the anus, and extending downwards. The owner could not say how long it had been there: the beast was one of a lot bought in April and it was only a few weeks ago that this enlargement was noticed. The animal was in perfect health, and on looking casually one would conclude there was probably a serous abscess, the result of horning.

I decided to operate, and got the bullock into a house. While manipulating to see where I would puncture, the bullock started to urinate and, as he did so, the enlargement gradually decreased and with the pressure of my hands almost disappeared. How glad I was that I had not punctured!

I now examined *per rectum* and could find no trace of a bladder in the normal position. I concluded this was the bladder, developed outside. I have seen the beast several times: he is in perfect health and is being fattened for slaughter, when I hope to make a *post-mortem* examination. The snapshot shows the condition fairly well.

I do not know if a similar case has been recorded.



Case III.—The subject of my next case was a cow, reported under the Tuberculosis Order, seen in December last. She was a nice five-year-old cow, but in very poor condition and with what looked like an abscess about the size of a turnip hanging between the base of the tongue and the larynx. The owner said it had been there about six months and the cow had got gradually poorer. There was no cough and the chest sounds were normal. On handling the supposed abscess, I found it quite doughy, and loose.

I decided it was not a case of tuberculosis, and advised the owner to have the abscess opened. On consideration, I thought it might not be best to open outside as a fistula might result, so I would try to get at it from inside. I got a gag fixed and, while examining about the base of the tongue, I felt a sharp prick: I then discovered a slit between the tongue and the jaw, from which I extracted 14 boot nails, about ½-inch size, two larger nails, two bits of tin, and two pieces of metal—one triangular in shape and about 3½ inches long.

The cow had evidently eaten the sole of a boot. While one would expect to find such things in the rumen, I have never seen or heard of such an accumulation in this position, and I am at a loss to know how it occurred. Perhaps someone will solve the puzzle. I saw the cow some weeks ago: she has improved in condition and appears in good health.

Case IV.—A couple of weeks ago I went to see a cow, reported under the Tuberculosis Order. She was a six-year-old, in fair condition, with a good coat and skin and not showing much sign of disease other than a cough at every movement. The chest sounds on the left were normal: there were no sounds over the right side of the chest. I thought there was probably an indurated lung and, as the owner was very anxious to have her out of the way, I destroyed her.

On opening the body, I could see no trace of disease; the contents of the abdomen were quite normal. On opening into the thorax I was surprised to find that the cow had only one lung, the left. The right chest was occupied by two stomachs, a rumen and a reticulum, communicating through an opening in the centre of the diaphragm with the natural stomachs.

All stomachs were full of ingesta, and I think I had cut through what may have been a second oesophagus. Had I expected such a find I would have been more careful. It was a cold, bitter day out on the side of a hill, not calculated to stimulate further investigation. I sent the entire contents of the thorax to the Veterinary College, Dublin, and I had a letter from Professor Browne stating that he has never seen or heard of another such case. The lung and stomach tissue had fused and some small openings communicated with the main bronchus: probably it was food particles getting along that way that caused the coughing. How was it that this cow appeared in perfect health up to a few months ago? She had had two calves and was a good milch cow.

SWINE ERYSIPELAS

A Ministry of Agriculture announcement warns farmers that now is the time to take preventive measures against this disease. All pig owners who in the past have suffered from repeated attacks on their premises are advised by the Ministry to consult their veterinary surgeons regarding the early treatment of their stock. The announcement continues: "Simultaneous inoculations with a properly adjusted dose of a specific serum and vaccine can be expected to give immunity from five to six months. Such inoculation is well worth while. Even if this year the mortality from the disease does not attain its worst possibilities, the deterioration of condition of fat pigs that ensues on an attack entails a serious loss both of food and value. Serum does not affect carcase condition. Should the disease break out where inoculation has been neglected, all the pigs exposed to infection should be treated with the serum alone. A fortnight later, all pigs that remain healthy should be vaccinated to give them a lengthy immunity. This interval of a fortnight is essential: an infected pig would probably not be able to stand vaccination. During an outbreak all sties and manure should be disinfected. Ailing pigs and contacts should be isolated. No new pigs should be brought in, and none sent away except for immediate slaughter. Particular care should be taken to look for early signs of the disease when selecting pigs for slaughter; an infected pig may produce discoloured meat likely to be condemned. All carcases should be buried in lime."

ABSTRACTS

[**I.—NOTES ON THE NEW ENGLAND OUTBREAK OF EQUINE ENCEPHALOMYELITIS.** Randall, R. (1939.) *Vet. Bull.* (Suppl. to *Army Med. Bull.*, U.S. Army.) **33**. 87-93.

II.—EQUINE ENCEPHALOMYELITIS. Kelser, R. A. (1940.) *Ibid.* **34**. 1-6.

III.—THE PREPARATION OF EQUINE ENCEPHALOMYELITIS VACCINE (CHICK) BY THE ARMY VETERINARY SCHOOL. Randall, R. (1940.) *Ibid.* **34**. 7-12.

IV.—THE EPIZOOTIOLOGY OF INFECTIOUS EQUINE ENCEPHALOMYELITIS IN THE UNITED STATES. Schoening, H. W. (1940.) *Ibid.* **34**. 13-19.]

I. In common with other areas of the United States, the New England States showed a high incidence of equine encephalomyelitis in 1938; 4·2 per cent. of horses in one county became affected, though in others the incidence was considerably lower, probably owing to the widespread use of chick embryo vaccine. The outbreak lasted from early June till mid-October, the peak occurring near the end of August. Thirty-eight cases were reported in humans in the same period and 25 of these were fatal, virus of the equine disease being demonstrated in seven. This condition was clinically distinguishable from other encephalitis of humans. Spread by contact did not occur in either equines or humans, and a biological vector (mosquito) is postulated. Wild birds are believed to act as reservoirs of the virus, as it has been recovered from dead birds found near outbreaks.

Randall describes a case in an Army horse. Contacts were vaccinated, but one developed the disease three days later, presumably due to infection before vaccination. The symptoms included high pyrexia, dullness in the early stages, followed by violent struggling, blindness, coma and death. Chick embryo vaccine proved very successful as a prophylactic agent in the control of the disease.

II. In 1931 Meyer, Haring and Howitt clarified the position of obscure nervous diseases in horses by identification of the virus of equine encephalomyelitis. Since that time much work has been done during successive epizoötics. Kelser succeeded in 1933 in demonstrating transmission by the *Aëdes* genus of mosquito.

The highest recorded incidence occurred in 1938 when 2·36 per cent. of the equines in the 39 States involved developed the disease. Only 40 cases were found among Army animals in the year, this low incidence being ascribed to precautions directed against exposing animals to mosquitoes, and the prompt use of chick vaccine in areas where the disease appeared. This success in combating the disease prompted the vaccination of the entire strength of horses and mules in the spring of 1939. While the incidence in the latter year was generally lower, not a single case occurred in Army animals. Severe reactions have in some instances followed the use of commercial chick embryo vaccine, and particular attention was therefore paid to the freshness and maintenance at low temperature of the product issued by the Army Veterinary School. No unfavourable results were reported.

III. Earlier immunising agents against equine encephalomyelitis included a 0·4 per cent. formalised vaccine from the brain of infected horses. The brain tissue contained commonly 1,000 guinea-pig m.l.d. per gramme, a low titre compared with the material made available by the growth of the virus on the chorio-allantoic membrane of the chick embryo, which shows about 500,000,000 m.l.d. per gramme. This enhanced titre, together with the greater ease with which material can be obtained, is an argument in favour of the use of chick embryo vaccine. This vaccine, which had proved valuable in the 1938 outbreak, was manufactured by the Army Veterinary School in sufficient quantity to immunise all 35,000 equines on the Army strength during the spring of 1939. Details of the preparation are given. Before issue the vaccine was tested for inactivation of the virus by intracerebral inoculation of guinea-pigs, and for its immunising properties by the ability of $\frac{1}{2}$ c.c. to protect a guinea-pig against the intracerebral inoculation of 1,000 m.l.d. of virus. No cases of equine encephalomyelitis occurred in the vaccinated animals.

IV. A variety of causes (forage poisoning, botulism, infection by cocci, and even strongyles) were blamed for the periodic enzoötics and epizoötics of encephalomyelitis before the recognition of the virus in 1931. Since the Californian outbreak of 1930, the disease has spread eastward. In 1933 the Eastern type virus was recognised on the New England seaboard, the disease being clinically more acute, and immunologically distinct. Statistics available for 1938 and 1939 show an incidence of 23·6 per 1,000 with a mortality of 21·4 per cent. for the former year, and 1·12 per 1,000 and 30·3 per cent. for the latter. The mortality in cases of the Eastern type in 1938 was 90·2 per cent. against 19·8 per cent. for the Western type.

The geographical boundary between the two types tends to disappear with spread from the coast. Cases of both Eastern and Western types have been found in parts of Alabama. It is now presumed that the disease is transmitted naturally by insects, though direct proof is lacking. The inter-season host of the virus has not been determined, in spite of the implication of wild birds in the New England outbreak mentioned above (see I). Occult infection, in which virus can be demonstrated in the blood of apparently healthy animals with slight pyrexia, takes place in an unknown number of animals. Reinfection of recovered animals has been recorded, but the majority withstand infection the following season. Susceptibility to the disease varies with age, young horses showing a lower incidence than mature animals. Animals at grass are less susceptible than those stabled, and mules are less suceptible than horses.

J. B. B.

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[**THE SIGNIFICANCE OF THE "CEASED" REACTOR TO BANG'S DISEASE.** Beach, B. A., Irwin, M. R., and Ferguson, L. C. (1940.) *J. agric. Res.* **61**. 75-80. (1 table, 2 refs.).]

The authors set out to answer the question, "Are animals that have lost their agglutinin titre to *Br. abortus*, following infection, a menace to the herds in which they are kept?" Twenty-one such cows, all of which had been experimentally infected, were divided into two lots and allowed to mingle with a total of 54 Bang-negative cows. They were observed through one or two pregnancies.

With one exception, *viz.*, a transitory udder infection of one cow in one quarter, *Br. abortus* was not

demonstrated in any of the "ceased-reactor" cows during life and in some cases after slaughter. None of the 54 Bang-negative cows showed evidence of having been infected by the ceased reactors, although one, which was in the same herd as that having the udder infection, developed a low titre. No brucella were recovered from this animal at slaughter.

The authors conclude that it is relatively safe to allow ceased reactors to mingle with non-infected stock, it being thought unlikely that such animals would be carriers of *Br. abortus*.

J. S. P.

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[EXPERIENCE WITH BRUCELLOSIS VACCINATION. Jenkins, E. A. (1940.) *Vet. Med.*, December, 1940. 681.]

The author severely criticises the official American "Test and Slaughter" policy for eradicating abortion. He strongly advocates calfhood vaccination with strain 19 (a semi-virulent strain), and states that from clinical field experience extending over five years he is convinced of its value. His main points are that (1) it is not harmful even to adult or pregnant animals; (2) it safeguards the owner from heavy economic loss since even if his herd is free it will sooner or later become infected and then the loss will be extremely heavy; (3) it improves the fertility records in infected herds and does not cause loss of milk; (4) the animals rapidly become negative to the blood test and remain so.

[These conclusions are based on the author's clinical observations and no figures are given. It is not clear if he regards vaccination as a means of eliminating abortion or whether he is arguing its use as the best practical means of controlling the disease.]

P. S. W.

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[FACTORS INFLUENCING LENGTH OF GESTATION AND BIRTH WEIGHT IN CATTLE. Knapp, B., Lambert, W. V., and Black, W. H. (1940.) *J. agr. Res.* **61**. 277-285. (13 refs.).]

This paper deals with the influence of the following factors on gestation and on birth weight in cattle—sex of calf, individual differences in cows, breed, calving sequence, weight of dam, and season of calving. The observations comprised 297 parturitions, 164 in beef and 133 in dairy Shorthorn cows. The findings are in general agreement with those already reported by other investigators. The average duration of gestation varied from 260 to 300 days, average 281 days; the greatest number of calvings took place between 280 and 284 days. The mean birth weights of the calves were 69·2 lb. for the beef and 79·2 lb. for the dairy Shorthorns.

There was little or no significant difference between the length of gestation and the sex of the calves. There was, however, a definite increase in birth weight with increase in the duration of gestation.

There was a tendency for individual cows to have a characteristic length of gestation period at successive parturitions, and the birth weights of calves produced from any one cow tended to be less variable than those of calves from different cows. First calves were considerably lighter than subsequent calves. Season of calving had little influence on length of gestation or on birth weights.

N. J. S.

IN PARLIAMENT

MINISTER ANNOUNCES APPOINTMENT OF AN "AGRICULTURAL IMPOVEMENT COUNCIL"

An important step in bringing the fruits of agricultural research into the hands of the farmer was announced in the House of Commons on Thursday of last week by Mr. R. S. Hudson, Minister of Agriculture.

Replying to Earl Winterton, the Minister said that he had appointed a body which would be known as the "Agricultural Improvement Council for England and Wales" with the following terms of reference:—"To devise methods for seeing that promising results of research are applied as rapidly as possible to the problems of agriculture and are incorporated in ordinary farming practice; and to advise from time to time concerning agricultural problems which appear to require scientific investigation."

The Council would consist of a chairman and 12 members, and the term of appointment would be for three years with a possibility of reappointment. The following were the names of the Committee: Sir Donald Fergusson, K.C.B., permanent Secretary of the Ministry of Agriculture and Fisheries (Chairman); Mr. Dennis Brown, farmer; Lord Cornwallis, M.C., Chairman of Kent War Agricultural Executive Committee; Professor T. Dalling, M.A., M.R.C.V.S., Institute of Animal Pathology, Cambridge; Professor F. L. Engledow, C.M.G., School of Agriculture, Cambridge; Captain E. Foster, O.B.E., Chairman of Shropshire War Agricultural Executive Committee; Mr. A. Holness, Editor of the *Journal of the National Union of Agricultural Workers*; Mr. C. Nevile, farmer, Vice-President of N.F.U.; Professor J. A. Scott Watson, School of Rural Economy, Oxford; Professor Sir R. George Stapledon, C.B.E., M.A., F.R.S., Welsh Plant Breeding Station, Aberystwyth; Professor W. W. C. Topley, F.R.S., Secretary of Agricultural Research Council; Mr. L. G. Troop, Agricultural Organiser and Executive Officer of Hants War Agricultural Executive Committee.

Mr. Hudson added that he had invited the Earl of Feversham to be a member of the Council on his return from active service abroad. The Technical Secretaries of the Committee were: Mr. J. C. F. Fryer, C.B.E., and Mr. E. C. Lloyd, M.R.C.V.S.; and the Administrative Secretary, Mr. W. R. Black.

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The following are among the further questions and answers recently recorded in the House of Commons:—

Livestock (Farm Quotas)

Colonel Carver (on June 11th) asked the Minister of Agriculture whether he has considered fixing a quota of livestock for every farm; and whether such a step is contemplated?

Mr. Hudson: As at present advised I do not consider it necessary to fix a specific quota of livestock to be kept

on every individual farm, but in carrying out the policy of culling inferior and unthrifty cattle from both dairy and beef herds which was announced on Saturday last, county war agricultural executive committees have been instructed to take account of the stocking policy of farms in the same way as they have hitherto dealt with crop production.

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FEEDING-STUFFS (DOGS AND CATS)

SIR C. RAWSON asked the Parliamentary Secretary to the Ministry of Food whether his inquiries into the question of profiteering in the sale of food for dogs in London, to the detriment of the provinces, where dog food is unobtainable in some cases, have been concluded ?

MAJOR LLOYD GEORGE : Inquiries regarding the prices of meat for feeding dogs are nearing completion, and I hope that it will shortly be possible to fix maximum prices. I have no reason to think that excessive prices are being charged for other dog foods.

LIEUT.-COMMANDER TUFNELL asked the Parliamentary Secretary to the Ministry of Food whether his attention has been called to the profiteering in horseflesh for dogs and cats ; whether he is aware that this has been in recent times quoted at prices which have yielded 300 per cent. profit ; why these prices are allowed ; and whether, considering that such meat is really the only food available to pet animals, he will investigate the whole issue, with a view, if necessary, to instituting controlled prices ?

MAJOR LLOYD GEORGE : I am aware that horseflesh is being sold at high prices for feeding dogs and cats. The sale of horseflesh other than for human consumption is, however, not controlled, but measures to deal with the trade in meat for animals, including the question of price, are at present being examined.

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MEDICAL PLANNING COMMISSION

MR. GROVES asked the Minister of Health whether he is aware that at least 67 medical men are engaged in the deliberations of the Medical Planning Commission to deal with the position of the medical profession after the war and primarily to prepare evidence to be submitted to a Royal Commission ; and whether he will arrange with the Central Medical War Committee that the services of these doctors should be more usefully employed in the interests of the State ?

MR. E. BROWN : I am aware that the British Medical Association has invited a considerable number of representative medical men and women to become members of a Medical Planning Commission whose terms of reference are : "To study war-time developments and their effects on the country's medical services both present and future."

I am not aware that the object of the Commission is "primarily to prepare evidence to be submitted to a Royal Commission." The members of this Commission are performing a useful public service in devoting part of their time to this work and I hope their deliberations will result in constructive suggestions which will make for an improvement in the country's medical services. The answer to the last part of the Question is in the negative.

IMPERIAL CANCER RESEARCH FUND

The following have been appointed to the Council of the Imperial Cancer Research Fund for the ensuing year : Chairman, Professor H. R. Dean, F.R.S.; Vice-Chairman, Sir Cuthbert Wallace; Elizabeth Wills Allen Fellow, Dr. L. Foulds; and Alice Memorial Fellow, Mr. R. J. Ludford, D.SC. Professor James Young has been appointed a Governor of the fund by the Royal College of Surgeons of Edinburgh, and Professor T. J. Bosworth, D.V.S.M., by the Royal Veterinary College and Hospital.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 25th.—Meeting of Scottish Metropolitan Division, N.V.M.A., at Moredun, 2.30 p.m.
June 26th.—Meeting of the South-Eastern Division, N.V.M.A., at Maidstone, 2.30 p.m.
June 26th.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Peterborough, 2.30 p.m.
June 26th.—R.C.V.S. Written Examination begins.
June 27th.—Meeting of the Sussex Division, N.V.M.A., at Brighton, 2.30 p.m.
June 30th.—R.C.V.S. Oral and Practical Examination begins.
July 11th.—Annual Summer Meeting of the Lancashire Division, N.V.M.A., at Manchester; luncheon 12.30 p.m. for 1 p.m.

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AGRICULTURAL IMPROVEMENT COUNCIL FOR ENGLAND AND WALES

Research and Farming Practice

It will be recalled that, during the recent debate on food production, the Minister of Agriculture, Mr. R. S. Hudson, announced that the Agricultural Research Council would be granted an increased sum for use at its completely unfettered discretion in promoting basic or fundamental research, and added :—

"At the same time we are impressed with the need of taking more active steps to see that the results of research are made known to the ordinary farmer and given greater opportunities of establishing themselves in everyday practice. To this end I propose to appoint a body for England and Wales which will be responsible to me directly and which, I hope, will command as much respect in the agricultural world as the Agricultural Research Council does in the scientific world. The functions of this new body will be twofold. On the one hand, it will be concerned to devise methods for seeing that all promising results of research are applied as rapidly as possible to the problems of agriculture and are incorporated in the practice of the everyday farmer. On the other hand, it will keep me informed—so that I can advise the Agricultural Research Council—on any problems of agricultural practice which it considers should be the subject of scientific investigation. A further announcement on the name and membership of the new body will be made in due course. As Scottish problems do, in many respects, differ considerably from those of England and Wales, my right hon. Friend, the Secretary of State for Scotland, will appoint a similar body for Scotland. I should add that it is hoped that members of the Agricultural Research Council will be appointed both to the English and the Scottish bodies so as to preserve as close a liaison as possible."

The Minister made his promised further announcement in the House of Commons on Thursday of last week. The statement, which is reproduced

in the Parliamentary Section of this issue, embodies the terms of reference of the " Agricultural Improvement Council for England and Wales "—as the new body appointed for these areas of the British Isles is named—which is charged with the duty of devising methods for seeing that promising results of research are brought as rapidly as possible into ordinary farming practice, and with advising the Ministry on agricultural problems requiring scientific investigation.

The Council consists of a Chairman and 12 Members, appointed for three years with a possibility of re-appointment. The choice of personnel of the committee, under the chairmanship of Sir Donald Fergusson, Permanent Secretary of the Ministry of Agriculture and Fisheries, including as it does most fittingly the name of Professor Thomas Dalling, the Secretary of the Association's Survey Committee, amongst the distinguished scientists serving with a number of practical farmers, and with Mr. E. C. Lloyd, another veterinarian, as one of the Technical Secretaries, will commend itself highly to the profession.

The importance attached by the Association to the necessity of bringing the fullest weight of scientific opinion and effort to bear on the problems of farming practice has been evidenced by the labours of its own special committee in the field of control of the diseases of livestock, and the profession will welcome most heartily the creation of this new body as a means of ensuring that Britain's farmers are made aware of research that is useful to them and are enabled to understand it and to apply its results.

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N.V.M.A. Watch Competition for Benevolence

Members are asked to note that all watch competition cards and money should now be sent to the General Secretary, N.V.M.A., 10, Bore Street, Lichfield, by Monday next, June 23rd.

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PERSONAL

The Birthday Honours

The Birthday Honours List this year is to appear in two sections, and that published on Thursday, June 12th—the official day for the celebration of His Majesty's birthday, which is on December 14th—was of civil honours only. We are pleased to note that the C.B.E. in the Order of the British Empire (Civil Division) has been conferred upon Mr. William Alexander Elder, O.B.E., J.P., F.R.C.V.S., Principal Veterinary and Agricultural Officer, for distinguished administrative services in Swaziland, S. Africa. Mr. Elder graduated at the N. Edinburgh College in May, 1902, and was awarded his Fellowship diploma in December, 1914.

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REGISTER OF VETERINARY SURGEONS, 1941

The Register of Veterinary Surgeons for 1941 has been printed in two editions: (1) A smaller edition comprising the Register of Members only; this has been issued free of charge to every member on payment of the annual fee. (2) A complete edition of which only a few copies have been printed, as a matter of economy. The latter has only just come from the press, the delay being mainly due to depletion of staff at the printers. It contains in addition to the List of Members, the Lists of Officers and past Officers of the College, the By-laws and Regulations, and as appendices, Complete list of the Officers of the Army Veterinary and Remount Services, the Ministries of Agriculture, Officers in Municipal Services and in the Colonial Veterinary Services. There are also lists of the Staff of the Veterinary Colleges and the Research Institutions.

The number of members registered is 3,855 as compared with 3,722 in 1940, an addition of 133. There were in fact 205 new graduates admitted during the year, and one name was restored, but against this there were 69 deaths and 4 removals for other causes. During the past four years the Register has grown very rapidly. The number of members registered in the past five years is:—

1937	...	...	...	...	3,545
1938	...	...	...	...	3,597
1939	...	...	...	...	3,659
1940	...	...	...	...	3,722
1941	...	...	...	...	3,855

The list of persons registered in 1881 as being at that time " Existing Practitioners " is now reduced to six.

Copies of the Register can be purchased from the offices of the College, 18, Victoria Avenue, Harrogate, price 5s., post free.

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VETERINARY COUNCIL (EIRE)

At a meeting of the Veterinary Council held June 4th, 1941, Mr. A. A. Donnelly, as Returning Officer, reported that at the Council elections held on May 23rd he declared Professor T. G. Browne elected as General Elected Member for four years, Mr. James Dodd, Sligo, as General Elected Member for three years, and Professor J. J. O'Connor as Limited Elected Member for four years.

Mr. James Dodd was unanimously elected President of the Council to hold office for two years and Professor A. F. O'Dea was elected Treasurer.

The following Committees were appointed:—

Standing and Penal Cases Committee: Professor O'Dea, Professor Kearney and the President.

Finance Committee: Professor O'Dea, Professor Kearney and the President.

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R.C.V.S. OBITUARY

Martin, James, sen., 15, Bridge Road, Wellington, Salop. Graduated Glasgow, April 10th, 1882. Died June 12th, 1941; aged 83 years.

Mr. James Martin, sen., M.R.C.V.S.

The passing of Mr. James Martin, sen., will cause widespread sadness in the profession, for he was a well-loved member. It will be remembered how strikingly this affection was shown by the warmth of the endorsement of the proposal to send " to a stalwart whose absence is deplored " greetings from the last Congress of the Association, held at Great Yarmouth in July, 1939, at which our old friend was unable to be present after a record of attendance unbroken over many years. Not only the parent body, but the Midland Counties Veterinary Medical Association, of which he was an ex-President and a most valued member, will miss him sorely.

Mr. Martin's career will be recounted in our next issue, when tribute will be paid to the value of his work in many spheres, for Mr. Martin was not only one of the best-known veterinary practitioners in Shropshire, but a

prominent and highly-respected figure in the local government of the town of his adoption—he went to Wellington from Lanarkshire in 1884.

The President, Mr. H. W. Steele-Bodger, represented the National Veterinary Medical Association at the funeral, which took place at Wellington Parish Church, of which Mr. Martin was an old member and sidesman, on Saturday last. Other members of the profession present were Mr. Frank Chambers (son-in-law) and Messrs. A. W. Allen, J. R. Barker, H. W. Dawes, Brennan DeVine, Tudor Hughes and R. P. Parsonage.

The Vicar voiced the thoughts of all present in a moving tribute to Mr. Martin's wonderful life of service, his impressive oration culminating with the words: "His family has lost a great father, his profession has lost a great member, his town has lost a great citizen and I have lost a great friend." To the family—Mr. Martin is survived by three sons and four daughters—we, too, extend deep sympathy in their grievous bereavement.

Mr. James Martin, jun., is in practice at Newport, Salop, while Mr. Tom. Martin succeeds his father in the practice at Wellington.

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THE LATE SIR D'ARCY POWER, K.B.E., F.R.C.S., F.S.A.

We are glad to have the opportunity of publishing the following tribute, received from a correspondent, to the great surgeon and medical historian, Sir D'Arcy Power, further to that inserted in our issue of May 24th, as throwing into yet clearer relief his association with and interest in the life of our own profession:—

"The medical journals have paid obituary tribute in their issues of May 31st to a beloved figure in the medical world, who both directly and indirectly may be said to have emulated John Hunter in his interest in comparative medicine. Following on his father, Henry Power, the ophthalmic surgeon at St. Bartholomew's Hospital, he continued to lecture on histology and physiology at the Royal Veterinary College, London, from 1890 to 1903. Both the Powers left behind them in the minds of several generations of veterinary students recollections of extremely kind and good teachers. At the time D'Arcy first began to accompany his father to the Camden Town College he was a junior member on the staff at Bart's, and when in his later years Henry Power became too busy with his work at Bart's, the teaching duties were handed over to D'Arcy. The old practical histology classroom and physiological laboratory were long replete with the tradition of the Powers. Probably there is now no surviving colleague of the régime of the Powers at the College except Professor Shave. Henry Power died in 1911 at the age of 82. The late Sir John M'Fadyean used to speak affectionately of him and recollected that Henry Power was the first to test him for his eyesight and prescribe the eyeglass which he used to wear for reading (and to intimidate interviewers) on one eye (his "good" eye, the other one was "no good"). Long afterwards, when D'Arcy's interest in veterinary medicine came to be generally forgotten in the medical world through the eminence he gained as surgeon and medical historian, he showed a return to his early leanings by the interest he took, in the early days after its foundation, in the Section of Comparative Medicine of the Royal Society of Medicine, being elected President during the years 1926-1928."

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ROYAL COLLEGE OF VETERINARY SURGEONS

D.V.S.M. Examination

At the recent D.V.S.M. examination held at Glasgow, the following candidates were successful in obtaining the Diploma:—

James Livingstone.

Andrew Wilson.

FOOT-AND-MOUTH DISEASE

A Tribute to the Ministry's Officers

Within recent months the outbreaks of foot-and-mouth disease assumed grave proportions, not only in Ireland, but in Scotland and the North of England. Happily the position is now vastly improved and consequently restrictions in the movement of livestock have been greatly modified.

The officers of the Ministry have rendered yeoman service in their endeavours to check the spread of the disease, and in this connection we have pleasure in reproducing, from *The Farmer and Stockbreeder* of June 10th, the following tribute from Mr. E. W. Langford, of Hereford, a prominent agriculturist who is an ex-president of the National Farmers' Union. Mr. Langford writes: "In the recent unfortunate series of outbreaks of foot-and-mouth disease I have come into close contact with veterinary officers of the Ministry of Agriculture and would like to express my appreciation of their work.

"They are thorough, tactful, painstaking, and efficient in every way, giving as little trouble as possible, consistent with doing their duty, a sense which seems to be highly developed.

"If only farmers would report early and co-operate better with the Ministry's veterinary officers I am certain that losses due to foot-and-mouth disease would be appreciably reduced."

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THE WEYBRIDGE TUBERCULIN

Report on Deputation to the Minister of Agriculture

At a special meeting of the Executive Committee of the Scottish Certified and T.T. Milk Producers' Association, Dr. Chalmers Watson, who represented the Association at the recent meeting with the Minister of Agriculture to which preliminary reference was made in our issue of May 31st, presented the following report:—

"In sequence to the trouble in the industry induced by the action of the Ministry in May last, in introducing—it was believed, prematurely—a new tuberculin produced for the testing of dairy stock, an influential deputation, representative of the English and Scottish herd owners' associations, was received by the Minister on May 12th. The Rt. Hon. The Earl of Iveagh, the Chairman of Council of the Tuberculin Tested Milk Producers' Association in England, introduced the deputation, which included representatives of seven leading Cattle Societies in England and a representative of the Scottish Association of Certified and T.T. Milk Producers. Lord Cranworth, who first raised the issue in a question in the House of Lords in August last, was unavoidably prevented from attending. Mr. James MacIntosh, Reading, presented the case for the producers; Dr. Chalmers Watson, speaking to a Supplementary Memorandum presented on behalf of the Scottish T.T. Milk Producers, from the point of view of "Science" and "Research" in their relation to modern developments in the industry.

The representations by the deputation of the main difficulties confronting herd owners at the present time were appreciatively received by the Minister, and some definite progress made towards finding a solution of the existing difficulties. The results of the Conference are summed up in the following.

1. It was arranged on the suggestion of the Minister that the deputation appoint two or three of their number to draw up their recommendations, to be discussed later, at a conference, with selected representatives of the Ministry, with a view to arriving at a solution of the existing difficulties *re* the test employed.

2. Prior to this meeting the Ministry would give the selected members the information desired in regard to the nature of the investigations in progress during the last nine months for determining the validity of the existing methods of testing the herds.

3. The present marked delay in announcing to herd owners the result of the test would be discontinued. An appropriate system of decentralisation would be speedily put into operation, whereby inspectors who perform the test would give the decision.

4. The Minister referred to, and somewhat amplified, the important decision, recently announced by him in the House of Commons, directed to promote an advance in agricultural and veterinary research in this country.

A valuable conference ended by Lord Iveagh expressing, on behalf of the deputation, their great appreciation of the Minister's interest and courtesy."

The report was discussed and adopted and Dr. Chalmers Watson was appointed to confer again with representatives of the other societies after the promised information has been received from the Ministry.

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Dr. Chalmers Watson's Evidence

Our readers will, we feel, find of interest the supplementary statement to which reference is made above, submitted to the Minister by Dr. Chalmers Watson on behalf of the Scottish Association of Certified and T.T. Milk Producers, and which was as follows:—

Introductory Note

This statement deals primarily with issues of "Science" and "Research." The views expressed are founded on extensive practical experience of the use of tuberculin and other specific bacterial products in the human subject, on personal interest and experience in allied research work in human and comparative medicine, on the close observation of the results of tuberculin testing of dairy stock during the last 15 years, during which period an additional effort has been made to ascertain the reliability of the test employed during that time, as revealed by *post-mortem* examination of a large number of cast cows —some 50 or more annually—all of which have passed through the same abattoir, and in a general survey of the literature of the tuberculin test since the introduction of synthetic medium tuberculin.

There is no room for *autocracy* in the world of Science and Research but there is often room for difference of opinion on matters of fact and their sound interpretation. If, in the following statement, a note of criticism is inevitable, I trust that this will be regarded as directed wholly against what I believe to be an erroneous outlook on research and practice based on it, and to have no personal application whatsoever.

For my present purposes, the essence of the difficulties that have confronted the Ministry and the herd owners during the past years lies largely within the statement which appears in the second paragraph of No. 5 on page 3 of the Memorandum submitted:—

> "In the interpretation of the results of the double intradermal test competent authorities have frequently emphasised that the character of the swelling is more important than the increase in skin thickness shown by measurement, but it is easier to state on paper an increase in measurement than a change in character."

The following notes and submissions are, of necessity, presented in mere skeleton form.

An Initial Error

Some seven years ago when the double intradermal test was first introduced, using synthetic medium tuberculin (a new product), an important demonstration, promoted by the Ministry, directed to prove its special practical value, was held at the Royal Dick Veterinary College, Edinburgh. In a series of eight animals an error of 25 per cent. was revealed, and the facts then ascertained and demonstrated have a very important bearing on the present position. The need for a standardised tuberculin with a recognised potency was strikingly emphasised by this demonstration. Recent events have clearly proved that the use of tuberculin with increased potency materially affects the character of the reaction induced by the injection. I need not elaborate the point further than to say that I feel sure that every one of the skilled veterinarians who were present concurred in the belief that the highly instructive demonstration clearly proved that we had much yet to learn regarding the whole technique involved in the double intradermal tuberculin test, and that very great caution should be exercised in promoting any new legislative and administrative measures connected with the test.

In relation to the above, I do not accept as satisfactory the explanation that is frequently put forward that the incidence of a marked positive reaction to the test, where no *post-mortem* evidence of tuberculosis is found on careful *post-mortem* examination, is adequately accounted for by assuming that a more complete examination by a "biological" or other test would reveal the presence of a tuberculous lesion, and so confirm the complete reliability of the test. Any such conclusion has, in my view, really no scientific foundation.

Before and After May, 1940

Prior to May last the general principle followed by inspectors was definitely to attach more importance to the general character of the swelling than to the size of the circumscribed hard swelling of skin, this being then regarded as a secondary manifestation—non-specific response. After the introduction of the Comparative Test, the instructions were, I was informed, reversed, more importance now being attached to the skin measurement. It seemed very strange, as I put it to the inspector, that the result of a scientific test should yesterday, so to speak, be judged largely by one standard, and to-day, by another, the two being, in essence, contradictory.

Relative to the above, I may point out that at an important discussion at the annual meeting of the National Veterinary Medical Association held in Bournemouth in 1937, at which the whole subject was under full review, the President at that meeting expressed a confident opinion in the following words: "If the reaction is a bean-like swelling (the circumscribed swelling referred to above) it is to be regarded as a negative, no matter how high the measurement may be."

The opening paper at the above discussion, by Major Douglas, gave, in my view, definitely the best and most reliable presentation of the facts *re* the test and its sound interpretation, which I have seen, but my general experience of its conduct leads me to the view that its value has been insufficiently appreciated, to the serious detriment of the industry. The explanation is doubtless partly to be found in one of his *obiter dicta* that "What is doubtful to one is not to another."

The importance of the valuable research work and resultant submissions of independent investigators, *e.g.*, R. F. Montgomerie and A. Thomson, published in 1939, appears to have been overlooked. These are expressed in the following passages:—

> (*a*) "Synthetic medium tuberculin has some tendency to produce pseudo-positive reactions in clean cattle."
>
> (*b*) "It is pleaded that further work on the potency of tuberculin for use in the double intradermal test is *urgently necessary.*"

It was, in the circumstances, very unfortunate that the truth and great value of the above, and very especially of (*b*) did not attract the attention they deserved. Further addition to our knowledge through highly skilled research with the necessary control observations is very essential. The information obtainable from the present routine "field" tests cannot be regarded as possessing other than a very restricted scientific and practical value.

Co-operation, Collaboration and Controlled Activity

While recognising the value of the double intradermal test as carried out prior to May last, the time has arrived when additional research measures, with the maximum co-operation on the widest scale, are required. The confidence of herd owners in Scotland has been badly shaken in the past year, and the real possibility of their withdrawing from the existing scheme is a matter of concern to the Committee of the Scottish Association. I feel sure that the Minister can rely on that Committee doing everything in its power to co-operate in meeting the present urgent needs.

It can, with reasonable confidence, be predicted that any real advance in the present outlook and practice of research on bovine tuberculosis at the present time would react in a very favourable manner indeed on the future development and progress of agriculture in this country, and for this full attainment the Scottish Committee are in complete agrement with the view that a certain amount of wisely planned decentralisation is a *sine qua non* to complete success.

In the meantime we respectfully submit that the weight of evidence, whether viewed from the scientific or practical side, is *overwhelmingly in favour of accepting* the recommendation made by the Association, to discontinue the use of the tuberculin introduced in May last, reverting to that in use previously, pending the research necessary if the confidence of the industry is to be restored.

* * * * *

ECONOMY IN FEEDING-STUFFS

Supplies of feeding-stuffs are very scarce, and the greatest economy has had to be exercised in fixing summer ration scales. Distributors and farmers are warned in an official announcement that, although in some localities stocks in the hands of millers and merchants may appear to be substantial enough to justify a larger issue of coupons, the national supply is such that only the barest minimum can be afforded while livestock are out at grass. Reserves of oil cake must be laid up against the larger winter needs, and supplies of cereal foods must be found in summer and winter alike for human consumption and for horses doing essential work. Only by restricting the issue of supplies for present use can some of the priority needs of the future be safeguarded.

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SWINE FEVER: A WARNING TO SUFFOLK FARMERS

At a recent meeting the Suffolk Diseases of Animals Joint Sub-Committee warned farmers to boil pig swill received from any source other than a certificated one, before giving it to their animals.

It was reported that there were at present seven cases of swine fever in East Suffolk, six of which were a month or more old, and eight cases in West Suffolk, all of which were a month or more old.

A letter was received from the Ministry of Agriculture which stated that the quarantine period for pigs which had been exposed to the disease through contact with affected animals should be extended from 14 to 21 days.

* * * * *

Germany, Norway, Sweden and Finland are said by the United States Department of Agriculture to be converting wood into livestock feed on a fairly extensive scale. These countries are normally dependent upon large quantities of overseas supplies of feed to maintain their important livestock industries. The British blockade, however, has cut off most of these supplies. The German conversion process is said to make use of sawdust, shavings and similar materials.—*Reuter.*

BERNHARD BARON TRUSTEES' GIFT FOR MEDICAL RESEARCH

At a meeting of the Council of the Royal College of Surgeons the President, Sir Hugh Lett, read a letter addressed to him by the Bernhard Baron Trustees, intimating the gift of £40,000 to the College, which recently suffered damage from bombs.

The purpose of the gift is to endow a Bernhard Baron Research Professorship at the Royal College of Surgeons to ensure that this important branch of the science of healing can be advanced still further. In their letter the Bernhard Baron trustees expressed their sincere sympathy with the Council on the serious loss sustained by the college owing to enemy action, and continued: "The trustees appreciate that for some time a large part of the financial resources of the college and of the energies of the Council and Fellows will be engaged in the erection of new buildings and the assembling of a collection of specimens which will re-establish the museum and make it once more the most valuable and complete of its kind in the world.

"The enemy may destroy our historic buildings and damage our artistic and scientific treasures, but our spirit will remain undaunted. The scientific work which has formed such a notable part of the activities of the Royal College of Surgeons of England must and will continue. The trustees realise, however, that one of the essential sinews of your and their endeavour to benefit mankind is the provision of funds for the prosecution of research. They have therefore decided to make a gift of £40,000 for the endowment of a Bernhard Baron Research Professorship at the Royal College of Surgeons so that, whatever the difficulties with which the council may be faced in other directions, research will not suffer.

"The trustees feel that in offering this gift to the headquarters of British surgery they are making a fundamental contribution to the promotion of the ideals which Bernhard Baron had in mind in his many acts of philanthropy—the improvement of the health and the increase of the happiness of his fellow men."

* * * * *

MINISTRY OF AGRICULTURE NEWS SERVICE

Sudden Growth of Backward Grass Favours Lactation Tetany.—During the spring months in certain districts there occurs in cattle a disease known as lactation tetany. This disease is sometimes found in stall-fed cows during the winter but is more commonly found in the spring when cows are turned out to grass. Cattle of all ages may be affected, but it most frequently seems to happen with cows that have been calved two or three months. There is an acute type of the disease in which the symptoms appear quite suddenly and death soon takes place. The characteristic symptoms are twitchings of groups of muscles with great excitement and convulsions. Soon there develops a state of semi-consciousness and exhaustion. At the height of the attack the animal breathes rapidly, the heart beats quickly and may be heard some distance off, there is much sweating and there may be voiding of urine and faeces. Most animals affected with this type of the disease do not recover. A milder form of the disease occurs in which the twitching of the muscles is pronounced and in which the convulsive stage does not occur. Animals so affected do not usually die; the symptoms gradually subside though there may persist a certain amount of unthriftiness and dullness.

Some seasons appear to be more conducive than others to the development of lactation tetany, especially those when there has been a backward spring with little growth followed by a rapid development of grass. Under such conditions, especially on certain farms, a reduction some-

times occurs in the magnesium content of the blood during the early days of grazing, when the cattle are most susceptible to the disease. The cause of this condition is unknown, but there is evidence that it can be prevented by adding 2 oz. of a mineral mixture containing 10 per cent. magnesium oxide to the daily ration during the late winter and early spring. This procedure is therefore recommended on farms where losses have been experienced.

. . . . .

Plough Policy Gets Results: More Milk From Re-seeded Pastures.—Mr. T. S. Hooper, who farms 2,300 acres at Newburgh Winfrith, Dorset, was sceptical when he was first advised that ploughing and re-seeding would improve his downland pastures. He agreed to an experiment, however, and in 1939 four acres were ploughed and sown. In the following spring, 230 sheep were folded on the land for 23 days. The four acres were then rested and subsequently cut for hay, yielding 25 cwt. per acre within a year of ploughing. Adjoining this experimental plot is a larger acreage of old pasture. It is 14 years old, past its best for downland grass and, to quote Mr. Hooper, "not to be compared in feeding value with the new herbage." Mr. Hooper has developed enthusiasm for re-seeding.

On another re-seeded field of 10 acres he turned in 27 cows: their milk yield rose by 14 gallons a day. These cows are a pedigree section of 250 head of milking stock and their appearance to-day does not in any way reflect the shortage of feeding stuffs.

Another 20 acres of re-seeded downland on Newburgh Farm will give several cuts for silage this year. It has a luscious growth, contrasting vividly with a neighbouring stretch of old pasture which could not be ploughed on account of its elevation. Mr. Hooper is confident that his extensive use of the plough all over the farm will enable him to keep the milk supply normal throughout the year. As one acreage of pasture is turned over to corn or roots a similar acreage of arable is brought back to grass—a grass that can have no better testimonial than the carefully kept records of this large tuberculin-tested dairy herd.

Hay Yields Could be Increased, but Quality More Important than Bulk.—Hay occupies more of Britain than all the cereal crops put together. If grazing be excluded, hay provides 40 per cent. of all the nourishment available from home-grown sources. But even so, its contribution could be considerably increased, and in at least three ways: by (1) pushing up yield; (2) improving the quality; (3) avoiding waste in storage and feeding.

The average yield of meadow hay is only about 20 cwt., and of clover and temporary grass about 27 cwt., per acre. We should be aiming at half as much again. Even now it is not too late to top-dress with nitrogen. The unpromising season so far makes it all the more important to get as much hay as we can under existing conditions. But the way *not* to increase the yield is to delay cutting and sacrifice quality for bulk. The crop should be cut so as to secure the maximum of leaf, for leafy hay is twice as nutritious as hay from coarse, stemmy herbage. Really good hay will replace concentrates, but this can only be obtained by cutting earlier than is the custom on many farms. Skilful making is the other main point for getting the greatest possible feeding value from every acre of hay. No more should be cut at one time than can be quickly cocked up and safeguarded from rain, or from too much sun, that will bleach the nourishment and palatability out of it.

Waste in storage is mainly due to bad stack building, or using too wide a base, or carrying too soon. The cut face of a properly made stack shows the plant stems pointing downwards and outwards, and this can only be achieved by keeping the centre high and treading the outsides well. Losses also occur from excessive heating, due to carrying before the hay is "made." To prevent this the ideal is a current of air from underneath and up through the centre. This means a staddle and the old fashioned device of a sack filled with hay pulled up through the centre as building proceeds.

Waste in feeding can be avoided by chaffing, trussing and laying out in the fields in small bunches zigzag fashion.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT OF 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th May, 1941	32	33*	9	662	—	—	11	36	13
Corresponding period in ...									
1940	20	22	—	—	1	1	4	162	124
1939	29	29	—	—	1	3	4	126	70
1938	37	50	3	437	1	2	6	40	20
Total 1st January to 15th May 1941	216	232	218	21,863	7	21	125	675	318
Corresponding period in									
1940	234	255	18	2,552	12	25	109	1,458	917
1939	367	391	29	4,357	26	55	146	618	375
1938	393	425	151	19,758	38	61	94	180	117

* 1 of these animals refers to an outbreak confirmed prior to May 1st, 1941.

NOTE.—The figures for the current year are approximate only.

§Excluding outbreaks in Army Horses.